In the claims:

Please amend the claims as follows:

1. (Previously presented) A method of modifying a media signal so that the media signal is authenticated by detecting an alteration to the media signal, the method comprising:

transforming at least a portion of the media signal into a set of frequency coefficients in a frequency domain;

adjusting a relationship between selected frequency coefficients to a reference value such that the alteration to the media signal to be detected alters the relationship, including computing the relationship as a function of relative magnitude of the selected frequency coefficients, the relative magnitude between the selected coefficients being adjusted to the reference value, the alteration being detected by computing the relationship and comparing the computed relationship with the reference value to determine whether a change in the relative magnitudes has occurred indicating that the alteration has occurred.

2. (Original) The method of claim 1 wherein the media signal is an image signal.

3. (Original) The method of claim 2 wherein the alteration to be detected is scanning, printing or photocopying the image signal.

4. (Original) The method of claim 1 wherein the relationship comprises a ratio between a selected coefficient and one or more neighboring coefficients.

5. (Original) The method of claim 4 wherein the relationship comprises a ratio between the magnitude of a selected coefficient and an average of neighboring coefficients.

6. (Original) The method of claim 1 including:

embedding a calibration signal into the media signal to enable a detector to compensate for changes in scale or translation of the media signal after being adjusted according to the relationship.

7. (Previously presented) A computer readable medium on which is stored software for performing a method of modifying a media signal so that the media signal is authenticated by detecting an alteration to the media signal, the method, comprising:

transforming at least a portion of the media signal into a set of frequency coefficients in a frequency domain;

adjusting a relationship between selected frequency coefficients to a reference value such that the alteration to the media signal to be detected alters the relationship, including computing the relationship as a function of relative magnitude of the selected frequency coefficients, the relative magnitude between the selected coefficients being adjusted to the reference value, the alteration being detected by computing the relationship and comparing the computed relationship with the reference value to determine whether a change in the relative magnitudes has occurred indicating that the alteration has occurred.

8. (Currently amended) A detector for authenticating a media signal that has been processed [~~according to a method of modifying the media signal so that the media signal is authenticated by detecting an alteration to the media signal, the method comprising:~~] by [~~transforming at least a portion of the media signal into a set of frequency coefficients in a frequency domain ;~~], and adjusting a relationship between selected frequency coefficients of the media signal to a reference value such that the alteration to the media signal to be detected alters the relationship, including computing the relationship as a function of relative magnitude of the selected frequency coefficients, the relative magnitude between the selected coefficients being adjusted to the reference value, the detector comprising:

memory for storing the media signal; and

a processor for detecting the alteration [~~being detected~~] by computing the relationship and comparing the computed relationship with the reference value to determine whether a change in the relative magnitudes has occurred indicating that the alteration has occurred.

9. (Previously presented) The detector of claim 8 including means for computing the relationship in a potentially corrupted version of the media signal and comparing the computed relationship from the potentially corrupted version with a threshold to detect alteration of the potentially corrupted media signal.

10. (Previously presented) A method of authenticating a media signal comprising:

evaluating signal peaks at selected frequency locations of the media signal, where the media signal has been previously modified to include peaks at the selected locations, at least some of the peaks being set such that the relative magnitudes of the peak at a selected location satisfies a predetermined relationship with magnitude at one or more other frequency locations; and

determining based on degradation of the signal peaks whether the media signal has been altered, including evaluating magnitude of at least some of the peaks relative to the magnitude at the one or more other frequency locations to detect a change in the predetermined relationship, the change indicating that the media signal has been altered.

11. (Original) The method of claim 10 including using one or more of the peaks to re-orient the media signal.

12. (Previously presented) The method of claim 10 including:

correlating the media signal with a calibration signal having an arrangement of peaks at selected frequency locations to determine translation and scale of the media signal.

13. (Original) The method of claim 12 including:

correlating the media signal with the calibration signal to determine rotation of the media signal.

14. (Original) The method of claim 10 wherein the media signal is an image.

15. (Original) The method of claim 10 wherein the media signal is an audio signal.

16. (Original) The method of claim 10 wherein the media signal is a video signal.

17. (Previously presented) A computer readable medium having software for performing a method of authenticating a media signal comprising:

evaluating signal peaks at selected frequency locations of the media signal, where the media signal has been previously modified to include peaks at the selected locations, at least some of the peaks being set such that the relative magnitudes of the peak at a selected location satisfies a predetermined relationship with magnitude at one or more other frequency locations; and

determining based on degradation of the signal peaks whether the media signal has been altered, including evaluating magnitude of at least some of the peaks relative to the magnitude at the one or more other frequency locations to detect a change in the predetermined relationship, the change indicating that the media signal has been altered.

18. (Previously presented) A watermark decoder comprising:

a detector for correlating a calibration signal with a media signal suspected of carrying a watermark to determine orientation parameters describing orientation of the media signal at embedding of the watermark, where the calibration signal includes a set of peaks at selected frequency locations, at least some of the peaks being set such that the relative magnitudes of the peak at a selected location satisfies a predetermined relationship with magnitude at one or more other frequency locations; and

an analyzer operable to orient the media signal using the orientation parameters and to evaluate whether the media signal has been altered after the embedding by examining signal peaks at selected frequency coefficients in the media signal, the analyzer being operable to evaluate magnitude of at least some of the peaks relative to the magnitude at the one or more other frequency locations to detect a change in the predetermined relationship, the change indicating that the media signal has been altered.

19. (Previously presented) The decoder of claim 18 wherein the detector and analyzer use at least some of the same frequency locations for determining orientation and evaluating whether the media signal has been altered.

20. (Previously presented) The decoder of claim 18 wherein the analyzer is used to detect reproduction of a printed image by examining degradation of the media signal at selected frequency locations.